

WHAT IS CLAIMED IS:

1. A process for devolatilizing a polymer comprising passing the polymer through a devolatilizer comprising a plate heat exchanger wherein the plates of the plate heat exchanger are heated by a plurality of heating tubes and wherein the heating tube comprises a return tube nested inside of a supply tube.
5
2. The process of Claim 1 wherein the supply tube contains a heat transfer fluid.
10
3. The process of Claim 2 wherein there is a pressure differential between the supply tube and the return tube such that the heat transfer fluid flows from the supply tube and into the return tube.
15
4. The process of Claim 1 wherein the polymer includes from about 40 to about 5 percent volatiles prior to being devolatilized.
20
5. The process of Claim 1 wherein the polymer includes from about 10,000 to 100 ppm volatiles after being devolatilized.
25
6. The process of Claim 1 wherein the polymer is selected from the group consisting of thermoplastic polymers, silicone polymers, elastomers, lubricants, and mixtures thereof.
7. The process of Claim 6 wherein the polymer is a thermoplastic selected from the group consisting of polystyrene, impact-resistant polystyrene, polyphenylene ethers, polycarbonates, polyvinyl chloride, polyurethanes,

polyetherimides, polyamides, polyesters, polyacrylates and polymethacrylates, linear polyethylene, their copolymers such as the styrene-acrylonitrile (ASA or SAN), styrene methyl-methacrylate, styrene maleic-anhydride, styrene-acrylonitrile rubber such as ABS or AES, styrene-methyl-methacrylate-rubber and the like, as well as mixtures of such polymers and copolymers, such as for instances polyphenylene-ether polystyrene and mixtures thereof.

8. The process of Claim 7 wherein the polymer is impact-resistant polystyrene.

10

9. The process of Claim 6 wherein the polymer is an elastomer selected from the group consisting of polybutadiene, polyisoprene, butylene rubbers, polyisobutylene, ethylene-propylene rubbers, and ethylene-propylene-diene (EPDM) rubbers; homopolymers of vinyl ethers, cyclic esters, methacrylic esters, acrylonitrile, and mixtures thereof.

10. The process of Claim 1 wherein the plate heat exchanger is prepared using a metal selected from the group consisting of carbon steel, stainless steel, aluminum, and combinations thereof.

11. The process of Claim 1 wherein the plate heat exchanger additionally comprises a common supply header and common return header.

12. The process of Claim 1 wherein each plate of the plate heat exchanger is in contact with no more than one heating tube.

13. The process of Claim 1 wherein at least some of the plates of the plate heat exchanger are in contact with at least two heating tubes.

14. The process of Claim 1 wherein the heat transfer fluid is selected from the group consisting of include air, nitrogen, water, oil, glycols, and mixtures thereof.

5 15. The process of Claim 14 wherein the heat transfer fluid is water in the form of steam.

16. The process of Claim 14 wherein the heat transfer fluid is oil.

10 17. A plate heat exchanger comprising at least one heating plate and a plurality of heating tubes wherein the heating tubes are positioned such that they can heat the heating plates using a heat transfer fluid flowing through the heating tubes and wherein the heating tube comprises a return tube nested inside of a supply tube.

15 18. The plate heat exchanger of Claim 17 having four heating tubes.

19. A plate heat exchanger comprising at least one heating plate and a plurality of heating tubes wherein the heating tubes are positioned such that they can heat the heating plates using a heat transfer fluid flowing through the heating tubes and wherein the heating tube comprises a supply tube nested inside of a return tube.

20 25 20. A process for cooling a material comprising passing a material to be cooled through the heat exchanger of Claim 19.